

**AWARD NUMBER:** W81XWH-19-1-0023

**TITLE:** Biopsychosocial Mechanisms of Chronic Pain Recovery and Maintenance

**PRINCIPAL INVESTIGATOR:** Krista Highland, PhD

**CONTRACTING ORGANIZATION:** HENRY M. JACKSON FOUNDATION, BETHESDA, MD

**REPORT DATE:** October 2021

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# REPORT DOCUMENTATION PAGE

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<b>14. ABSTRACT</b> This study seeks to understand the mechanisms that sustain or resolve chronic pain within a biopsychosocial framework. The objective of the present study is to identify biopsychosocial markers of chronic pain maintenance (Maintained) and recovery/improvement (Improved).					
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**1. INTRODUCTION:**

Many military service members, veterans, and their family members have chronic pain; which in turn, negatively impacts quality of life, retention, and readiness. Though many studies show how people develop chronic pain, less is known about how people recover from it. To improve chronic pain management, the goal of this study is to understand how emotional, social, and biological factors predict who recovers from chronic pain and who does not. Samples and self-report data of 150 individuals (50 chronic pain maintained, 50 chronic pain improved, 50 controls) will be

**2. KEYWORDS:**

Chronic pain, biomarkers, microRNA, integrative pain management

**3. ACCOMPLISHMENTS:**

**What were the major goals of the project?**

**CY19 Goals**  
Functionality tests of integrated firmware and software (complete)

**CY20 Goals**  
Obtain IRB approval (complete)  
Obtain Biobank sample request forms (complete)  
Complete agreements (complete)

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**Remaining goals on hold due to COVID 19 Pandemic:**

**CY20 Goals**  
Identify psychosocial/behavioral factors distinguishing groups

**CY21 Goals**  
All samples banked, aliquoted, and analyzed  
Manuscript preparation on blood biomarkers

**CY22 Goal**  
Manuscript preparation on salivary biomarkers

**What was accomplished under these goals?**

An agreement between DVCIPM and WRAIR was completed.

**Milestones listed below are ON HOLD due to COVID-19 Pandemic:**

Milestone 2: Identification of psychosocial and behavioral factors distinguishing groups [original target date 1MAY2020]

Milestone 3: All samples banked and aliquoted. [original target date 1MAY2021]

Milestone 4: Manuscript on the biopsychosocial predictors of chronic pain maintenance and recovery. Depending on results, there will likely be a need to divide results into 2-3 manuscripts.

**What opportunities for training and professional development has the project provided?**

Nothing to Report

**How were the results disseminated to communities of interest?**

*Nothing to Report*

**What do you plan to do during the next reporting period to accomplish the goals?**

1. Continue to work with the Pain Registry Biobank administrators and scientist to obtain samples as soon as they become available. This includes the approval of the Pain Registry Biobank sample and data request. We are maintaining weekly communication with the Biobank leadership to ensure we are aware of when samples will become available.
2. If COVID-19 Pandemic-related barriers subside, we plan to obtain samples.
3. If COVID-19 Pandemic-related barriers do not subside, we plan to determine alternative strategies to accomplish the specific aims and discuss with the agency grants official to determine documentation requirements

**4. IMPACT:**

**What was the impact on the development of the principal discipline(s) of the project?**

*Nothing to Report*

**What was the impact on other disciplines?**

*Nothing to Report*

**What was the impact on technology transfer?**

*Nothing to Report*

**What was the impact on society beyond science and technology?**

*Nothing to Report*

**5. CHANGES/PROBLEMS:**

**Changes in approach and reasons for change**

Nothing to report

**Actual or anticipated problems or delays and actions or plans to resolve them**

The COVID19 Pandemic is having large impact on the timeline of this study, not only for obtainment of samples, but also the continued progress on other study aims and goals; as employee time and laboratory access will be limited (COVID-related studies are taking precedent in the current environment; as such, there will be a deluge of backlog items that the study team will need to complete once operations are back to normal). Though NMC-SD Pain Registry Biobank site was recruiting prior to the COVID19 Pandemic, recruitment was then halted at NMC-SD (Pain Clinic) due to COVID19 Pandemic. To mitigate these challenges, the PI has worked extensively with the Pain Registry Biobank to develop logistics for recruitment to enable fastidious recruitment into the Pain Biobank that target the samples needed for the present study, whenever the COVID19 Pandemic impact is no longer present. Moreover, the Biobank's WRNMMC recruitment site incurred significant challenges in recruiting both controls and cases due to the COVID-19 Pandemic. As a result and given the PI's excellent relationship with the WRNMMC Department of Research Programs, they discussed alternative recruitment strategies that could be used by any WRNMMC study, including the Biobank. As such, the research manager of the Biobank is now awaiting an amendment determination and signature to allow for "passive" recruitment (e.g., having a table in the hallway of the WRNMMC America building ground floor and in the different recruitment clinics, as well as leveraging a partial HIPAA waiver to be able to consent participants over the phone prior to their scheduled appointment. However, it is noted that the timeline for which samples will be made available (e.g., 6-18 months) is unclear, as evidenced by the Delta variant (and any new and emerging variant).

**Changes that had a significant impact on expenditures**

Due to the COVID19 Pandemic, study activities were placed on hold. As such, study funds have not been able to be used.

**Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents**

**Significant changes in use or care of human subjects**

*Nothing to Report*

**Significant changes in use or care of vertebrate animals**

*Nothing to Report*

**Significant changes in use of biohazards and/or select agents**

*Nothing to Report*



**6. PRODUCTS:**

- **Publications, conference papers, and presentations**

**Journal publications.**

*Nothing to Report*

**Books or other non-periodical, one-time publications.**

*Nothing to Report*

**Other publications, conference papers and presentations.**

*Nothing to Report*

- **Website(s) or other Internet site(s)**

*Nothing to Report*

- **Technologies or techniques**

*Nothing to Report*

- **Inventions, patent applications, and/or licenses**

*Nothing to Report*

- **Other Products**

*Nothing to Report*

**7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**

**What individuals have worked on the project?**

No change (1.09 LOE)

**Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**

Dr. Highland also received a no-cost extension for the “Association of High-Risk Medications with Health Outcomes and Early Attrition Among Post-Deployment Soldiers with Pain” grant for a period to be funded to December 2021 and received another CDMRP grant. Overall, Dr. Highland’s active (and future active) support will not have any impact on the effort required for the present award and Dr. Highland is able to reduce effort on Biomarker Signatures of the Sleep Pain Enigma Award, as their effort in the project has been largely completed, aside from manuscripts.

**What other organizations were involved as partners?**

*Nothing to Report*

**8. SPECIAL REPORTING REQUIREMENTS**

**COLLABORATIVE AWARDS:**

**QUAD CHARTS:**

**9. APPENDICES:**



# PR181212/ E00705.1a: Biopsychosocial Mechanisms of Chronic Pain Recovery and Maintenance

co-PIs: Highland, USU, MD/ Hammamieh, USACEHR, MD

Budget: \$762,314

Topic Area: Chronic Pain Management

Mechanism: Funding Opportunity

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Research Area(s): 0701 - Clinical Biomarkers, 1504 - Systems Biology

Award Status: 30SEP2019-29SEP2020

## Study Goals:

**CY19 Goal** – Submit IRB protocol

Functionality tests of integrated firmware and software

**CY20 Goals** – Obtain samples and differentiate groups

Obtain IRB approval

## **ON HOLD DUE TO COVID-19 PANDEMIC:**

**CY20 Goals** - continued

Obtain Biobank sample request approval (completed forms, awaiting Biobank Oversight Committee approval)

Identify psychosocial/behavioral factors distinguishing groups

**CY21 Goal** – Blood biomarker analyses

All samples banked, aliquoted, and analyzed

Manuscript preparation on blood biomarkers

**CY22 Goal** – Salivary biomarker analyses

Manuscript preparation on salivary biomarkers

## Specific Aims:

**Aim 1:** To identify baseline (a) biomarkers and (b) psychosocial/ behavioral factors uniquely associated with group membership (Controls, Maintained, Improved), then explore interrelationships.

**Aim 2:** To identify (a) biomarker and (b) psychosocial/behavioral factor changes (baseline to ~6-week follow-up) uniquely associated with Maintained versus Improved group membership, then explore interrelationships.

**Aim 3:** To identify salivary biomarker correlates of plasma biomarkers associated with chronic pain maintenance and recovery/improvement.

## Key Accomplishments and Outcomes:

**Publications:** none to date

**Patents:** none to date

**Funding Obtained:** none to date